IN THE CLAIMS

1. (Currently Three Times Amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue, said plasma generated from a gas consisting ~~essentially~~ of ammonia.

2. (Original) The method of claim 1, wherein said opening is a High Aspect Ratio (HAR) contact opening.

3. (Original) The method of claim 2, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

4. (Original) The method of claim 3, wherein said opening is contacted with ammonia gas in the absence of oxygen.

5. (Previously Cancelled)

6. (Previously Amended) The method of claim 2, wherein said contacting is done at a temperature within the range of about 250-500° C.

7. (Original) The method of claim 6, wherein said contacting is performed in a plasma reactor within a power reactor range of about 500 - 2500 watts.

8. (Original) The method of claim 7, wherein said contacting is performed within a power range of about 1500 - 2000 watts.

9. (Original) The method of claim 7, wherein said contacting is performed with an ammonia gas flow rate within the range of about 500 to 1000 SCCM.

10. (Original) The method of claim 9, wherein said contacting is performed at power of about 1900 watts and a temperature of about 350°C.

11. (Original) The method of claim 10, wherein said contacting is performed with an ammonia gas flow rate of about 750 SCCM.

12. (Original) The method of claim 9, wherein said contacting is performed for a period of less than about 100 seconds.

13. (Original) The method of claim 12, wherein said contacting is performed for a period of not more than about 75 seconds.

14. (Previously Amended) The method of claim 1, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

15. (Previously Amended) The method of claim 1, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

16. (Currently Twice Amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device, comprising the steps of:

contacting said opening with ~~an oxygen containing~~ a plasma consisting of oxygen to remove a portion of said etch residue, stopping said oxygen plasma contacting before said polymer etch residue is completely removed and thereafter removing any remaining said residue by contacting said opening with a second plasma, said second plasma ~~generated from~~ consisting of a hydrogen containing gas.

17. (Previously Amended) The method of claim 16, wherein said contact opening is an High Aspect Ratio (HAR) opening, and said second plasma contacting step is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

18. (Previously Amended) The method of claim 17, wherein said second plasma contacting occurs in the absence of oxygen.

19. (Cancelled)

20. (Previously Amended) The method of claim 18, wherein said second plasma contacting is performed at a temperature within the range of about 250 – 500° C.

21. (Previously Amended) The method of claim 18, wherein said second plasma contacting is performed in a reactor operating in a power range of about 500-5000 watts.

22. (Previously Amended) The method of claim 20, wherein said second plasma contacting is performed at a temperature of about 350°C.

23. (Original) The method of claim 21, wherein said reactor power is about 1900 watts.

24. (Previously Amended) The method of claim 21, wherein said second plasma contacting is performed at a flow rate within the range of about 100 to 4000 SCCM.

25. (Previously Amended) The method of claim 15, wherein said second plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

26. (Previously Amended) The method of claim 25, wherein said bottom of said opening is not oxidized during said second plasma contacting step.

27. (Original) The method of claim 24, wherein said contacting is performed for a period of less than about 100 seconds.

28. (Original) The method of claim 27, wherein said contacting is performed for a period of not more than about 75 seconds.

29. (Currently Three Times Amended) A method of forming a contact opening in a semiconductor device, comprising:

a) etching a contact opening in an insulative layer in said device down to a polysilicon element of said device;

b) contacting said opening with an oxygen plasma to remove a portion of said etch residue; and

c) ~~cleaning~~ removing any remaining etch residue from said etched opening by contacting said opening with a plasma ~~generated from~~ consisting of a hydrogen containing gas in the absence of added oxygen.

30. (Original) The method of claim 29, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

31. (Original) The method of claim 30, wherein said contacting is performed under conditions which do not oxidize said opening.

32. (Previously Cancelled)

33. (Previously Cancelled)

34. (Currently Amended) The method of claim ~~33~~ 29, wherein said contacting is done in a plasma reactor at a temperature within the range of about 250 - 500° C, with a

reactor power within the range of about 500 – 2500 watts, with an ammonia gas flow rate of about 500 to 1000 SCCM, and for a period of no more than 100 seconds.

35. (Original) The method of claim 34, wherein said contacting is performed within a reactor power range of about 1500 - 2000 watts.

36. (Original) The method of claim 34, wherein said contacting is performed with a reactor power at about 1900 watts and a temperature of about 350°C.

37. (Previously Amended) The method of claim 34, wherein said contacting is performed at a gas flow rate of 750 SCCM.

38. (Original) The method of claim 35, wherein said contacting is performed for a period of not more than about 75 seconds.

39. (Original) The method of claim 29, further comprising forming a silicide layer at the bottom of said contact opening following said contacting operation.

40. (Previously Cancelled)

41. (Original) The method of claim 29, wherein an insulating layer is formed on said device prior to said etching and said etching forms a contact hole in said insulating layer.

42. (Original) The method of claim 41, wherein said etching is dry etching.

43. (Original) The method of claim 42, wherein said dry etching is performed using at least one fluorine-containing gas.

44. (Original) The method of claim 43, wherein said fluorine-containing gas is at least one gas selected from the group consisting of CH_2F_2, CHF_3, C_2F_6, C_2HF_5, and CH_3F.

45-49 (Cancelled)

50. (Currently Twice Amended) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

removing polymer residue from said contact opening using a plasma consisting ~~essentially~~ of ammonia gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

51. (Previously Cancelled)

52. (Original) A method as in claim 50 further comprising removing a potion of said polymer residue from said contact opening with oxygen prior to using said gas which provides an oxide free bottom of said contact opening.

53. (Original) A method as in claim 50 wherein said silicide layer is a titanium silicide layer.

54. (Currently Amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue; said plasma generated from a gas consisting ~~essentially~~ of hydrogen gas.

55. (Previously Added) The method of claim 54, wherein said opening is a High Aspect Ratio (HAR) contact opening.

56. (Previously Added) The method of claim 55, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

57. (Previously Added) The method of claim 56, wherein said opening is contacted with hydrogen gas in the absence of oxygen.

58. (Previously Added) The method of claim 55, wherein said contacting is done at a temperature within the range of about 250-500° C.

59. (Previously Added) The method of claim 58, wherein said contacting is performed in a plasma reactor within a power reactor range of about 500-2500 watts.

60. (Previously Added) The method of claim 59, wherein said contacting is performed within a power range of about 1500-2000 watts.

61. (Previously Added) The method of claim 59, wherein said contacting is performed with a hydrogen gas flow rate within the range of about 500 to 1000 SCCM.

62. (Previously Added) The method of claim 61, wherein said contacting is performed at power of about 1900 watts and a temperature of about 350°C.

63. (Previously Added) The method of claim 62, wherein said contacting is performed with a hydrogen gas flow rate of about 750 SCCM.

64. (Previously Added) The method of claim 61, wherein said contacting is performed for a period of less than about 100 seconds.

65. (Previously Added) The method of claim 64, wherein said contacting is performed for a period of not more than about 75 seconds.

66. (Previously Added) The method of claim 54, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

67. (Previously Added) The method of claim 54, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

68. (Previously Added) The method of claim 54, wherein said plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

69. (Previously Added) The method of claim 54, wherein a bottom of said opening is not oxidized during said plasma contacting step.

70. (Currently Amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue; said plasma generated from a gas consisting ~~essentially~~ of methane gas.

71. (Previously Added) The method of claim 70, wherein said opening is a High Aspect Ratio (HAR) contact opening.

72. (Previously Added) The method of claim 71, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

73. (Previously Added) The method of claim 72, wherein said opening is contacted with methane gas in the absence of oxygen.

74. (Previously Added) The method of claim 71, wherein said contacting is done at a temperature within the range of about 250 - 500° C.

75. (Previously Added) The method of claim 74, wherein said contacting is performed in a plasma reactor within a power reactor range of about 500 - 2500 watts.

76. (Previously Added) The method of claim 75, wherein said contacting is performed within a power range of about 1500 - 2000 watts.

77. (Previously Added) The method of claim 75, wherein said contacting is performed with a methane gas flow rate within the range of about 500 to 1000 SCCM.

78. (Previously Added) The method of claim 77, wherein said contacting is performed at power of about 1900 watts and a temperature of about 350°C.

79. (Previously Added) The method of claim 78, wherein said contacting is performed with a methane gas flow rate of about 750 SCCM.

80. (Previously Added) The method of claim 77, wherein said contacting is performed for a period of less than about 100 seconds.

81. (Previously Added) The method of claim 80, wherein said contacting is performed for a period of not more than about 75 seconds.

82. (Previously Added) The method of claim 70, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

83. (Previously Added) The method of claim 70, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

84. (Previously Added) The method of claim 70, wherein said plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

85. (Previously Added) The method of claim 70, wherein a bottom of said opening is not oxidized during said plasma contacting step.

86. (Previously Added) The method of claim 16, wherein said hydrogen containing gas is ammonia gas.

87. (Previously Added) The method of claim 16, wherein said hydrogen containing gas is hydrogen gas.

88. (Previously Added) The method of claim 16, wherein said hydrogen containing gas is methane gas.

89. (Previously Added) The method of claim 30, wherein said hydrogen containing gas is ammonia gas.

90. (Previously Added) The method of claim 30, wherein said hydrogen containing gas is hydrogen gas.

91. (Previously Added) The method of claim 30, wherein said hydrogen containing gas is methane gas.

92. (Currently Amended) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

removing polymer residue from said contact opening using a plasma consisting ~~essentially~~ of hydrogen gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

93. (Previously Added) A method as in claim 92, further comprising removing a portion of said polymer residue from said contact opening with oxygen prior to using said gas which provides an oxide free bottom of said contact opening.

94. (Previously Added) A method as in claim 92, wherein said silicide layer is a titanium silicide layer.

95. (Currently Amended) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

removing polymer residue from said contact opening using a plasma consisting ~~essentially~~ of methane gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

96. (Previously Added) A method as in claim 95, further comprising removing a portion of said polymer residue from said contact opening with oxygen prior to using said gas which provides an oxide free bottom of said contact opening.

97. (Previously Added) A method as in claim 95, wherein said silicide layer is a titanium silicide layer.